Team Number : 8
Project Title : Mental Health Tracker
Software Design Document

Prepared by Team 8:

Lavanya RA(19Z328)
Rishika Vijaykalyan(19Z341)
Sravya Vankadara(19Z348)
Suchitha Malisetty(19Z350)
Sushmitha S(19Z352)
T S Swaminathan(19Z357)

PSG College of technology

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1. INTRODUCTION

1.1 Purpose

The purpose of this document is to structure and give an elaborate description of the software required to develop a Mental Health Tracker. This software is being developed in order to switch the manual Mental Health Tracker to a more reliable, convenient and portable online system. Some of the basic functions the software should be capable of are: Tracking one's mood and giving appropriate recommendations to improve one's happiness quotient, providing a journal where one can pen down their feelings and connecting the user to a professional therapist of their choice.

This document outlines the purpose, features and constraints of the system. It will explain what the system will do, what the interfaces of the system are and how the system will interact with external stimuli

1.2 Scope

The Mental Health Tracker aims to help its users to increase their happiness quotient by analysing their current emotions. All the user has to do is answer a few simple questions that the application prompts and they would be supplied with powerful tips or suggestions for improving their mood.On a long term view, the user can also view the overall happiness state over the course of a month / week, which might help them understand the progress they are making and motivate them to continue doing the same. The application helps the user to connect with therapists to seek professional guidance.It also ensures that when the user is assigned a therapist, it would be a very comfortable journey for the user thereafter and thus it takes preferences from the user and displays the shortlisted profiles.The users are also provided with the facility jot- down their thoughts/ feelings in a virtual diary which is perfectly secure.

1.3 Overview

The Mental Health Tracker's primary objective is to provide recommendations so as to improve the user's mood. The user will also be able to contact the therapist of their choosing in case they require professional assistance. Furthermore, it offers a safe space for the users to pen down their thoughts and feelings.

1.4 Reference Material

Peterson, Richard. “Sql vs Nosql: What's the Difference between Sql and Nosql.” *Guru99*, 28 Aug. 2021, https://www.guru99.com/sql-vs-nosql.html.

Schaefer, Lauren. “Nosql vs Sql Databases.” *MongoDB*, MongoDB Developer Advocate, https://www.mongodb.com/nosql-explained/nosql-vs-sql.

Vallaure, Christine. “Figma: All You Need to Know.” *Medium*, UX Planet, 1 Apr. 2021, https://uxplanet.org/figma-all-you-need-to-know-156b52b88e54.

1.5 Definitions and Acronyms

Provide definitions of all terms, acronyms, and abbreviations that might exist to properly interpret the SDD. These definitions should be items used in the SDD that are most likely not known to the audience

SDD	Software Design Document
SRS	Software Requirement Specification
REQ	Requirement
OCD	Obsessive Compulsive Disorder

2. SYSTEM OVERVIEW

The Mental Health Tracker’s main functions are to:

● Collect information from the user through an interface, analyze the answers, find out a pattern in the data, map it to appropriate recommendations targeted to improve their mood and deliver it to the user.

● Provide a forum for the user to express their thoughts and feelings in a journal.

● Recommend the user a suitable therapist of their choice to seek help from, if necessary.

3. SYSTEM ARCHITECTURE

3.1 Architectural Design

We use Call and Return architectural design to support the system and go-about its proper functioning.

Mental health tracker has 4 main functions or modules:

1. Login / Sign-up

   This module is for the users to access and utilize the website's services. If the user is new to the website, he/she must sign-up. Otherwise, the user must provide correct credentials to login to the website.

   Sub-modules associated with Login/Sign-up:

   1. User login
   2. User sign-up

2. Happiness Tracker

   Once the user is logged in, the user can choose to do a variety of activities such as tracking their current mood, journaling their thoughts and feelings and scheduling appointments with therapists.

   This module analyzes the user's mood by giving them a set of questions to answer. Based on their answers, Mental Health Tracker maps it to appropriate recommendations targeted to improve the user's mood/happiness quotient.

   Sub-modules associated with Happiness Tracker:

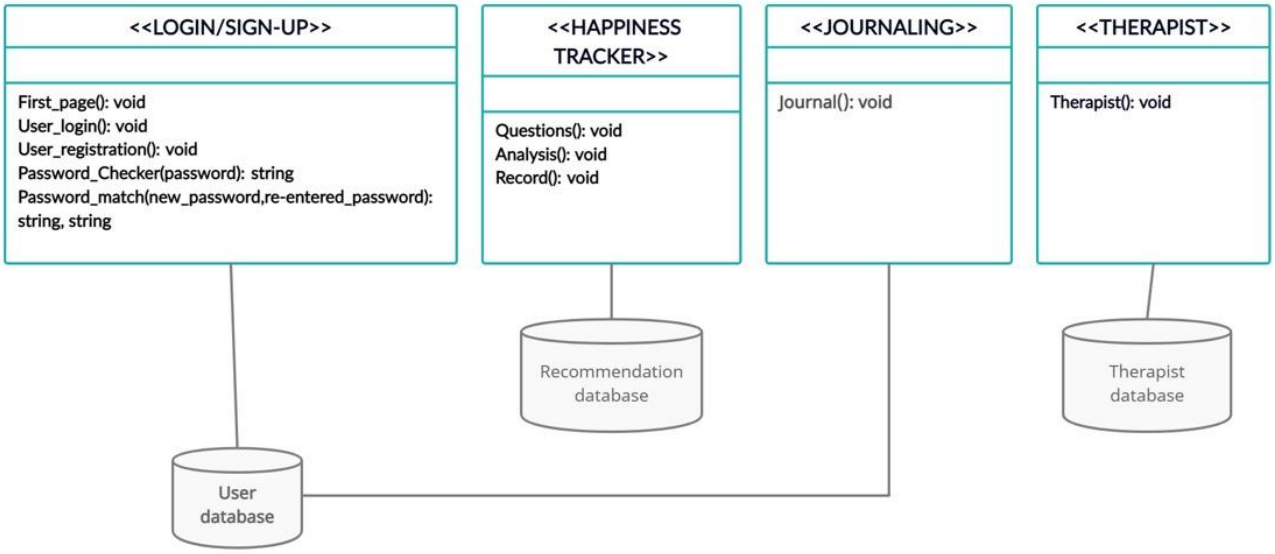
   1. Mood data analysis
   2. Weekly / Monthly analysis display

3. Journaling

   This module offers the user a safe space to pen down their thoughts and feelings. The user can write about their day in general, a particular incident, their wishes etc and also choose to save/discard it after writing. This module has no further sub-modules associated with it.

4. Connecting to a therapist

   This module helps the user seek professional help or guidance, thereby connecting them with a therapist of their choice.



3.2 Decomposition Description

3.2.1 Login / Sign-up

Login and sign-up are performed by two separate modules given below.

1. User registration

   The first step for a user is to make sure they've signed-up to access the website. To sign-up the user is asked to enter their details such as name, age, gender, date of birth and Email-ID. If the email-Id already exists, the user is intimated and is prompted to enter another one. Otherwise, the user is asked to enter the new password twice for confirmation. Once all the steps are completed, the user's details are stored in the user database.

2. User login

   The user, once registered, must login every time to access the website. To login, the user must provide the Email-ID he/she used to register and enter the correct password. Once the credentials entered by the user matches with the one in the user database, he/she can continue to the website. Else, the user is denied access to the website and is prompted to enter correct credentials.

3.2.2 Happiness Tracker

After logging in, if the user wishes to track their current mood and receive recommendations to improve it, he/she can take up the questions under happiness tracker and get tips to improve their mood. The user can also view his/her mood data of any particular day or month. Each of these operations are performed by separate sub-modules given below.

1. Mood data analysis

   For the application to analyze the user's mood, the user needs to answer a set of multiple choice questions based on how they are feeling at the moment. Depending on the option they selected, a certain number of points are added to the score as they go about answering questions. Once they finish answering, the overall score calculated is used to analyze the user's mood and is displayed on the screen. Appropriate recommendations, based on the analysis, to improve the user's mood are also displayed on the screen.

2. Weekly/Monthly analysis display

   The user can also view his/her mood data spanning over a day or a month of their choice. To do so, the user must first choose daily or monthly analysis. In daily analysis, a timeline of all the mood data analysis, which was taken up by the user during different times of the day is displayed. In monthly analysis, an average of all the mood data analysis performed on each day of the month is taken and displayed.

3.2.3 Journaling

After logging in, if the user wishes to pen down their feelings, the journaling module helps them do so.

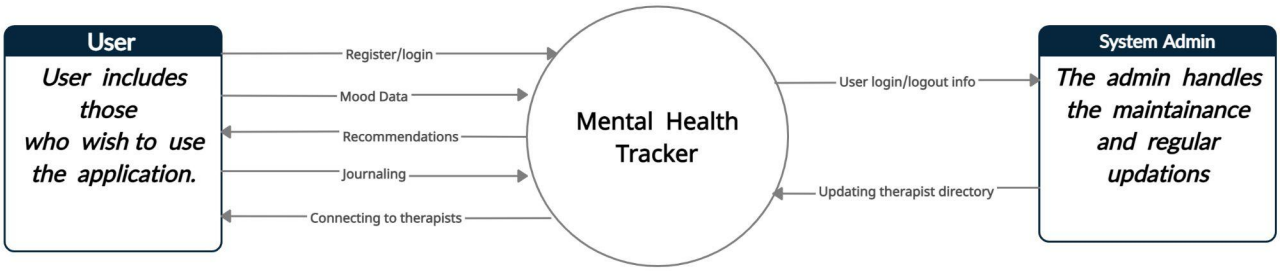
The user can diarize their thoughts and feelings, day-to-day activities, wishes etc in the text editor provided by this module. After writing, the user can choose to save or discard the journal. Through this activity, the user can identify their problems and concerns and also track any symptoms everyday to help them recognize triggers and learn better ways to control them. The user will also be able to view all the previous journals written.

3.2.4 Connecting to therapists

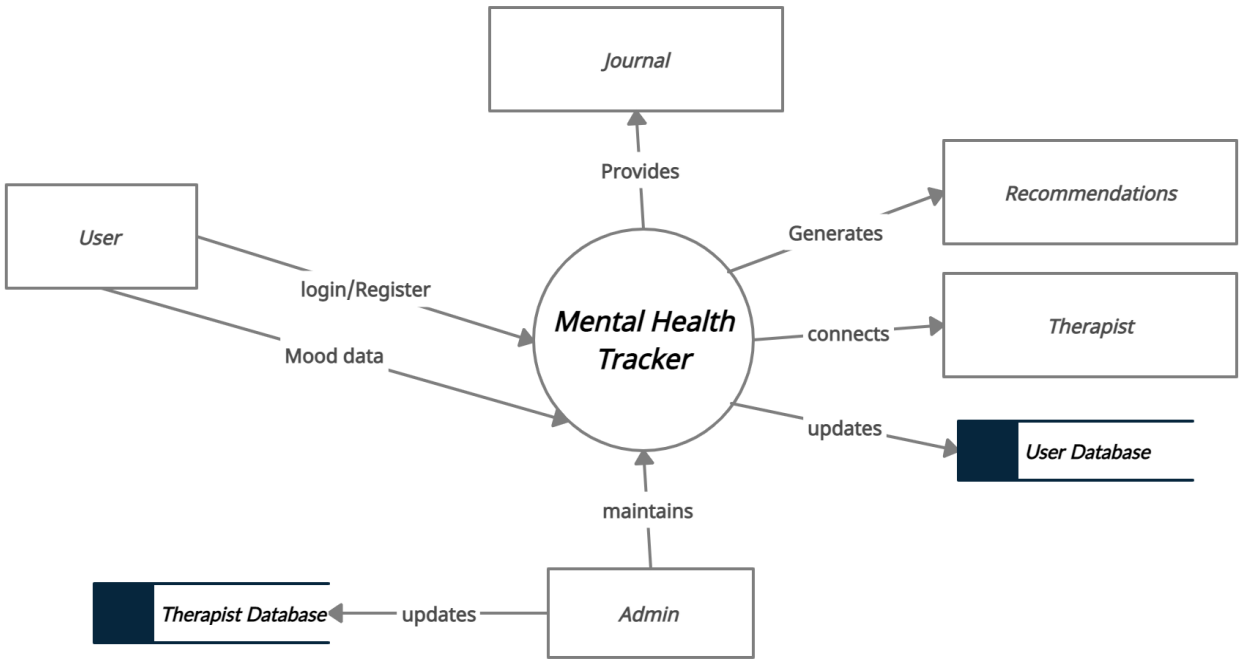
After logging in, if the user wishes to seek professional help or guidance, this module can help fix an appointment with the therapist of their choice.

Firstly, the user must enter the gender preference of the therapist, if any. Secondly, he/she must choose an age group reference, if any. Thirdly, the user can select the number of years of experience preference of the therapist, if any. Lastly, the religion of the therapist can be chosen too. Based on the user preference, the website displays a list of suitable therapists and their detailed profiles, from which the user can choose and proceed to make an appointment.

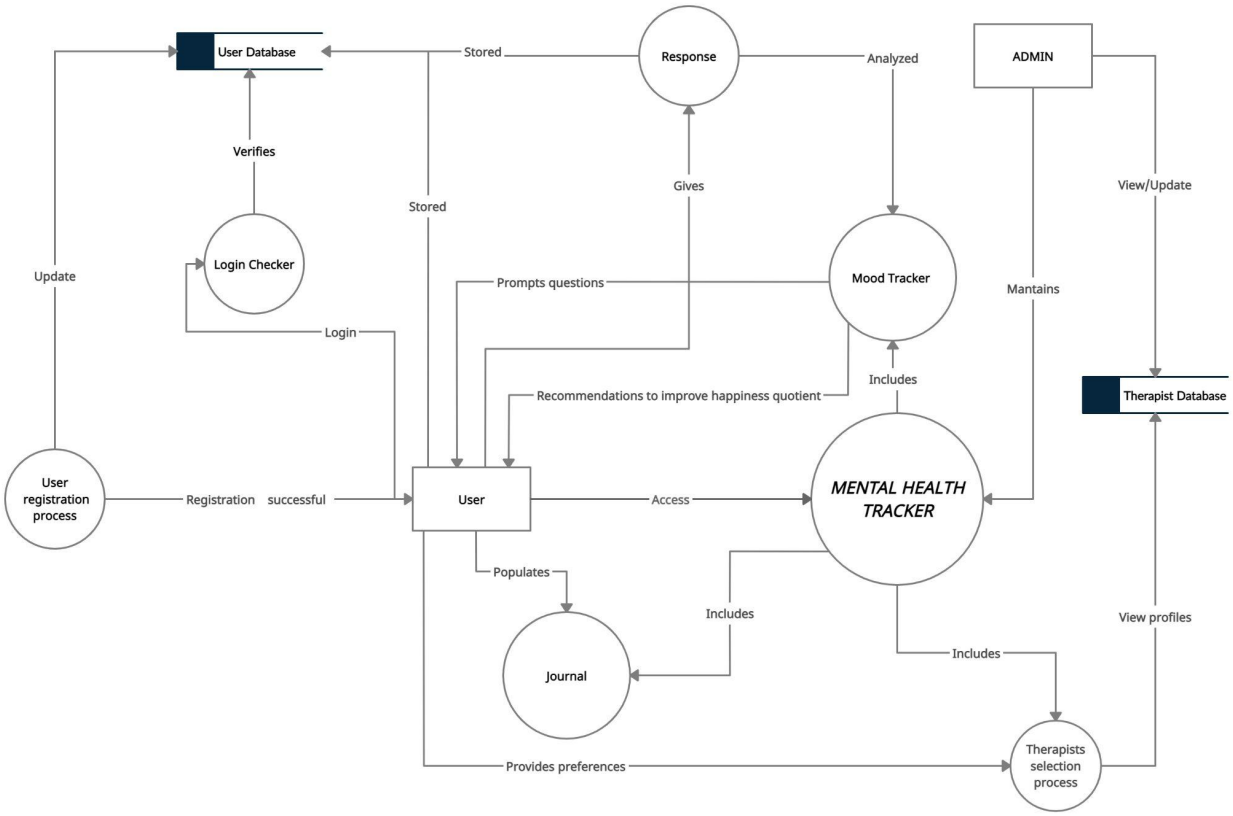
0-level Data Flow Diagram



1-level Data Flow Diagram



2-level Data Flow Diagram



3.3 Design Rationale

We use call and return architecture for Mental Health Tracker as it supports system modifiability, scalability and performance. Under this we are working with the sub-style –

Main program or Subprogram architectures.

The main program structure decomposes into a number of subprograms or functions into a control hierarchy. Main program contains a number of subprograms that can invoke other components.

Some critical issues that we faced are –

1. Difficulty in parallel processing

2. Difficulty to distribute across traditional machines.

3. Exceptions to normal operation are awkward to handle.

4. Enabling the multi user environment and simultaneous usage of files.

4. DATA DESIGN

4.1 Data Description

Large Majority of the information used is stored in a NoSQL database (mongoDB) instead of a relational database. This is because NoSQl supports structured, semi-structured and unstructured data. This makes it especially useful in the cases of web applications as web applications contain many different document types such as binary files, pdfs, images etc. Moreover NoSQL gives more lenience of using a more lax schema; which is beneficial for our application as data is not very strictly structured. There aren't many relations between the different subsystems hence NoSQL is more useful for our product.

4.2 Data Dictionary

Function Name	Function variables	Data Type	Description
First_page	option	String	Takes user input of what action they want to do
User_login	Email_id	String	the email_address through which account was registered
	Password	String	Given password for account

User registration	username	String	Username input taken from user
	age	int	Age of user taken from user
	dob	Date	The date, month and year taken from user
	gender	String	The gender information taken from user
	email_id	String	Valid email id taken from user
	Password	String	Used to verify the user
Password_checker	length	int	Used to measure that the password is of the right length (between 8 and 15
	caps	int	Used to Ensure there is at least one uppercase letter in password
	password	String	Parameter of function, data from input given by user in earlier functions
	FLAG	String	Returned value, tells whether given input string was satisfying constraints
Password_match	new_password	String	Initial Password given by user
	re-entered_password	String	Re-entered password given by user
Journal	option	String	Stores the option the user selected to perform
	filename	String	Stores the title of the file, getting it from either the user or database
	file	Pointer	Points to the file with the given filename
Questions	Questions	String array	Stores all the questions to be posed to the user
	score	int	Returned value, stores the accumulated numeric answer given

			for each question
Analysis	Score	int	stores the accumulated numeric answer given for each question
	date_added	time	stores the date on which the entry is made
	time_added	time	Stores the time at which the user made the entry
	Mood	String	Stores a descriptive word to define the user's emotions
	option	String	Signifies the user choosing other options available on screen
Record	entry	String	Contains information regarding the mood stored on the given day
	Date	time	Stores the day of the data entered
	Month	time	Stores the month of the data entered
	Year	time	Stores the year of the data entered
	Time	String	Contains an associated colour to the String stored in entry
	Day	String	Contains an associated colour to the String stored in entry
Therapist	Question	String array	Stores all the questions to be posed to the user
	Answer	String 2D array	Stores all the options to the questions posed to the user
	Input	String array	Stores the option selected by user
	Prompt	int	Stores the index of the question

5. COMPONENT DESIGN

First_page()

Choose option (login / register)

If (option==login)

CALL user_login()

ELSE

CALL User_registration()

END iF

User_login()

Get the Email id

Get the Password

IF the entered Email id is in the User_database THEN

Email id <- TRUE

IF the entered Password is in the User_database for that Email id THEN

Password <- TRUE

END IF

END IF

IF Email id = TRUE AND Password = TRUE

DISPLAY(“You have logged in successfully”)

CALL Book_ticket() method

ELSE

DISPLAY(“TRY AGAIN”)

CALL User_login() method

END IF

User_registration()

Get user name

Get user age

Get the user's date of birth

Get the user's gender

Get the Email id

IF the entered Email id already exists in the User_database THEN

DISPLAY("Email id already exists")

CALL User_registration()

ELSE

Get new Password

Call Password_Checker (password)

If(valid)

Confirm the new password, re-enter password

CALL Password_match (new_password, re-entered_password)

IF(!valid)

DISPLAY("Password does not match"

CALL User_registration()

ELSE

Create a new account

Save the new record to the User_database

END IF

END IF

END IF

Password_Checker(password)

```
IF(length of password>8 and length of password<15)
        length=0
        WHILE(length<length of password)
                IF(password[length] is alphanumeric)
                        length++;
                ELSE
                        FLAG=invalid
                        Break while
                IF(password[length] is caps)
                        caps=1;
        End while
        IF(i=length of password and caps=1)
                FLAG=valid
        ELSE
                FLAG=invalid
        END IF
ELSE
        FLAG=invalid

END IF

RETURN FLAG
```

Password_match(new_password,re-entered_password)

```
IF (new_password == re-entered_password)
        RETURN valid
ELSE
        RETURN invalid
```

Home()

```
Display Greetings
Display welcome messages
Display options
IF(option == “open_journal”)
{
        CALL journal()
}
IF(option == “therapy”)
{
        CALL therapist()
}
IF(option == “happiness_tracker”)
{
        CALL Analysis()
}
```

Journal()

```
Display text area
Display options
If (option == “exit”)
```

```
        CALL home()
    ELSE IF (option == “create new”)
        CALL journal()
    ELSE IF (option== “save”)
        Create file using date
        Save file under profile ID
    ELSE If(option== “View”)
        Display all journal files under that profile ID
        Choose file
        Display contents of the file
    ELSE if(option==”logout”)
        CALL logout()
```

Questions()

```
    Array Questions[5]
    score= 0
    For scale in range(5)
        Display Questions[scale]
        Get input
        score= score + input
    END For
    RETURN score
```

Analysis()

```
    Score = CALL Questions()
```

```
If (score < 16 )
        Mood = “bad”
ELSE If (score <32 )
        Mood = “moderate”
ELSE
        Mood = “Good”
END IF
Store Mood, date and Time into database
Find suggestions using Mood from recommendation database
Display Suggestions
IF option ==”record”
        CALL Record()
END IF
IF option ==”logout”
        CALL logout()
END IF
```

Record()

```
Display options
IF (option==”Daily analysis”)
        Display timeline
        Get the date
        entry = Retrieves entries for the date given from database
        IF ( entry == “happy”)
                Time = Green
```

```
        ELSE IF (entry == “Moderate”)
            Time = Yellow
        ELSE
            Time = Red
    ELSE IF( option ==”Monthly Analysis”)
        Display Monthly calendar of the year
        Retrieve data of each day
        IF ( count(bad) <count(moderate) )
            IF (count(moderate) > count(good)
                Day = Yellow
            ELSE
                Day = Green
        ELSE
            IF (count(bad)>count(good))
                Day = Red
            ELSE
                Day = Green
    ELSE IF (option ==”logout”)
        CALL logout()
    END IF
```

Therapist()

```
    Array Questions[5]
    Array Answers[5][5]
    Array Input[5]
    Questions[0] = “Select gender preference for your therapist”
```

Questions[1] = “Select age group preference for your therapist”

Questions[2] = “Select experience preference for your therapist”

Questions[3] = “Does it matter to you if the therapist has a particular religious affiliations”

Questions[4] = “Select Specialization of your therapist”

Answers[0][0]= “Male”

Answers[0][1]= “Female”

Answers[0][2]=Doesn’t matter

Answers[1][0]= 25-30

Answers[1][1]= 30-40

Answers[1][2]=40+

Answers[1][2]=Doesn’t matter

Answers[2][0]= 25-30

Answers[2][1]= 30-40

Answers[2][2]=40+

Answers[2][3]=Doesn’t matter

Answers[3][0]= 0-2

Answers[3][1]= 3-6

Answers[3][2]=7-10

Answers[3][2]=7-10

Answers[3][4]=Doesn’t matter

Answers[4][0]= Yes

Answers[4][1]= No

Answers[5][0]= Depression

Answers[5][1]= OCD

Answers[5][2]= Anger management

```
For prompt in range(5)
        Display Questions[prompt]
        For option in range(length(Answers[prompt]))
                Display Answers[prompt][option]
        END For
        Get input_value
        Input[prompt] = input_value
END For
Format query for database using Array Input
Display result of query from database
IF (option ==”logout”)
        CALL logout()
END If
```

Logout()

```
CALL first_page()
```

6. HUMAN INTERFACE DESIGN

6.1 Overview of User Interface

6.1.1 Login/ Sign up

The user logs-in if they already have an existing account by entering their email and password or they create a new account by entering details like name, age, date of birth, gender, mobile number and email id.

6.1.2 Homepage

After logging in, the user is directed to the homepage, where they can:

- Asses their mood today by clicking the happiness tracker button
- Start writing down their thoughts or whatever is on their mind
- Connect with therapists

6.1.3 Happiness Tracker

On clicking this button, the user is asked a series of questions about his mood, to which they answer accordingly. After answering all the questions, they are suggested activities to do to help improve their mood. Monthly analysis of a user's mood can be viewed after clicking on the record button while taking up the test.

6.1.4 Journaling

On clicking on this button, the user can write down their thoughts, feelings, daily goals and so on. The user can click on the save button to save what has been written or can discard it.

6.1.5 Connect with therapists

Clicking on this button, the user is able to view a list of therapists that have matching preferences. The user is able to go through the list and book an appointment with the therapist of their desire.

6.2 Screen Images

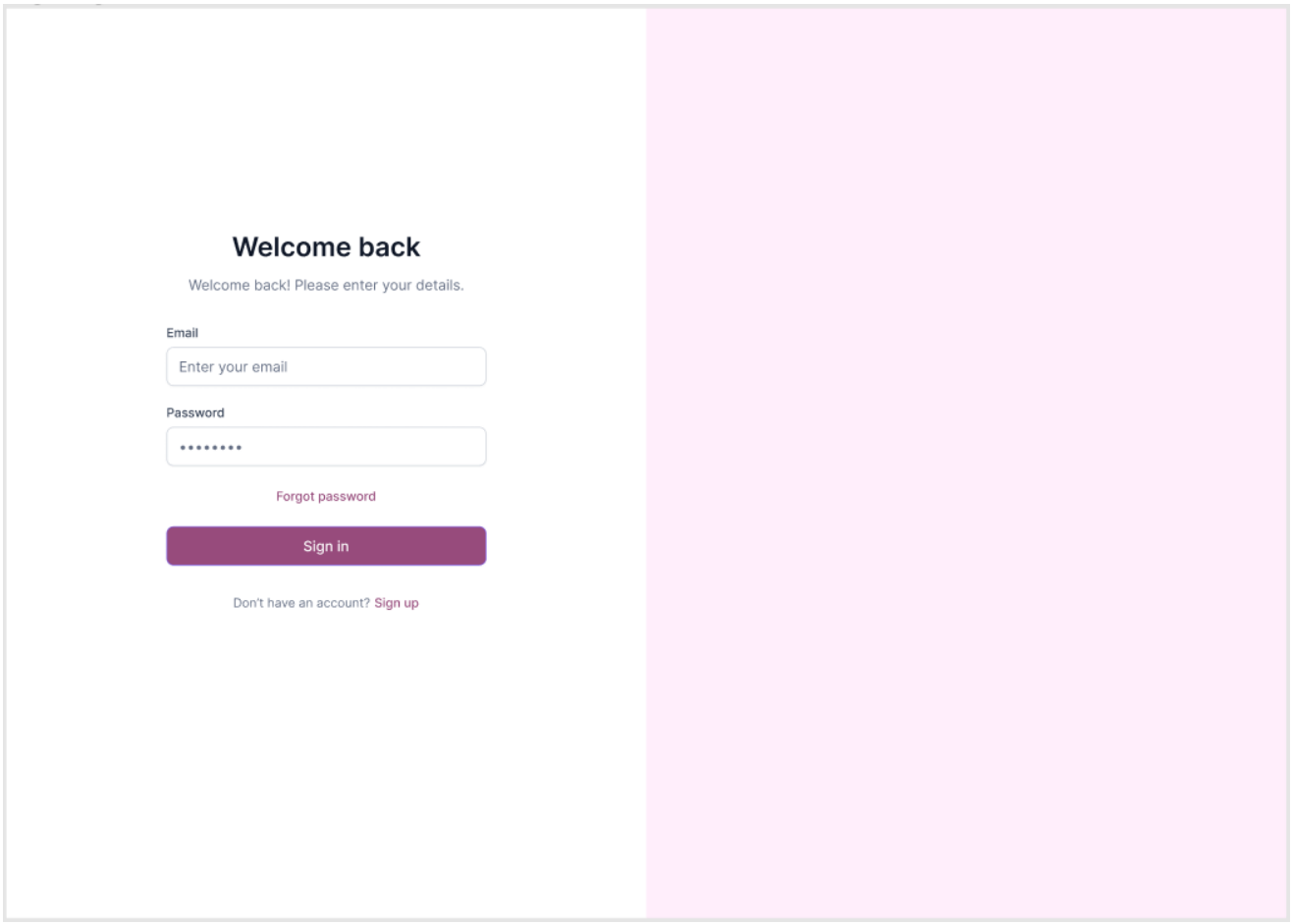


Image 6.2.1

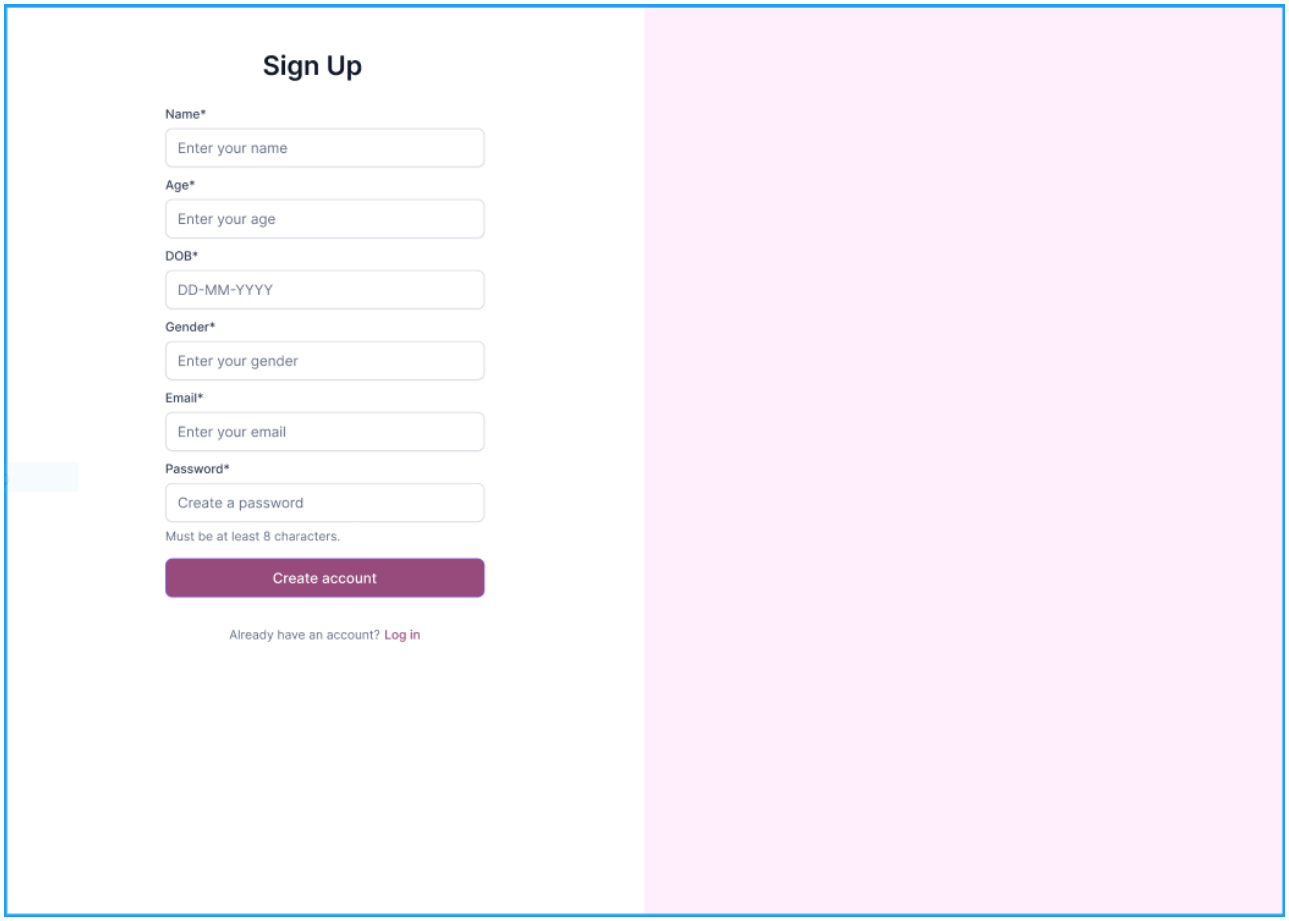

Sign Up
Name*
Enter your name
Age*
Enter your age
DOB*
DD-MM-YYYY
Gender*
Enter your gender
Email*
Enter your email
Password*
Create a password
Must be at least 8 characters.
Create account
Already have an account? Log in

Image 6.2.2

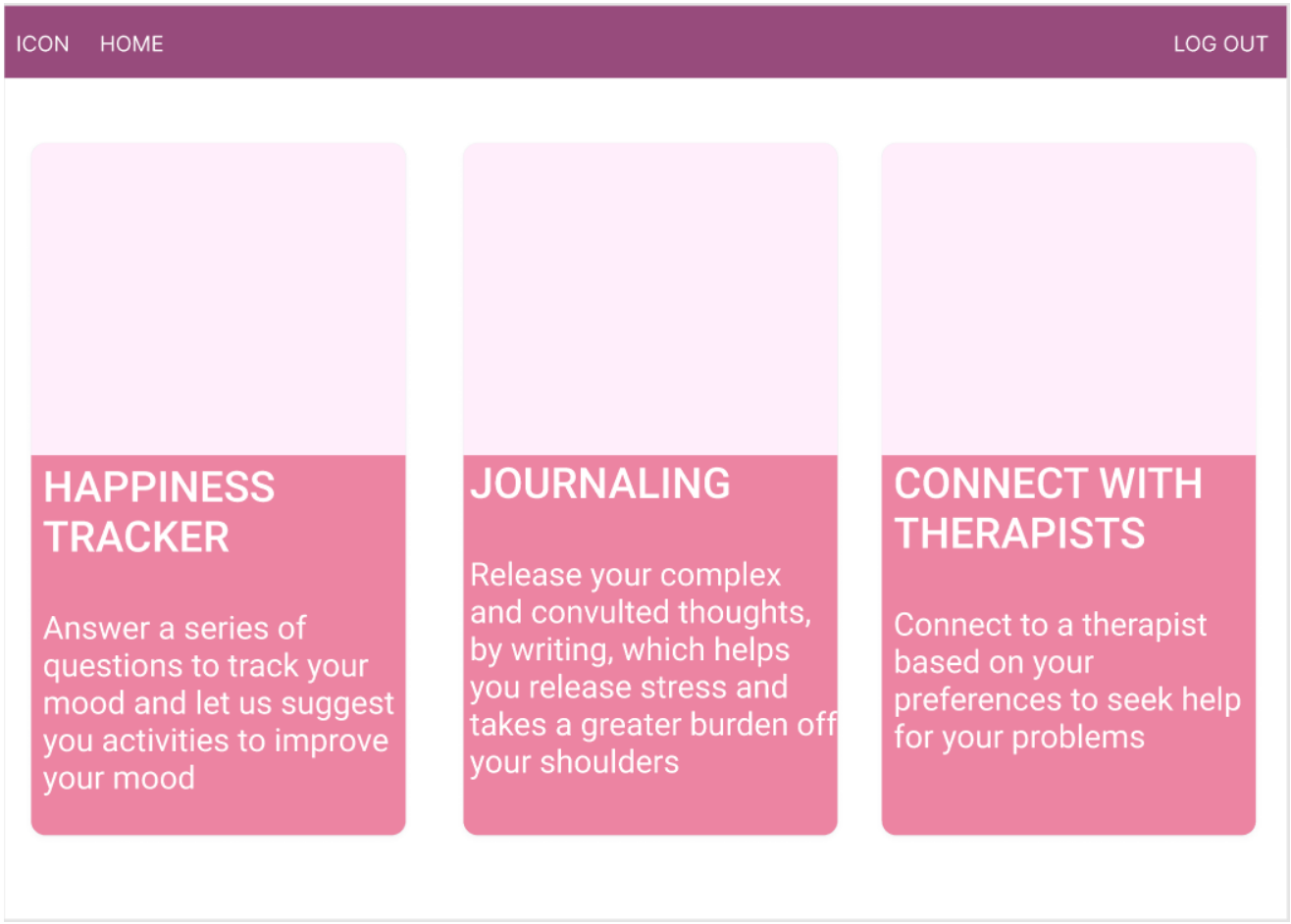

ICON
HOME
LOG OUT
HAPPINESS TRACKER
Answer a series of questions to track your mood and let us suggest you activities to improve your mood
JOURNALING
Release your complex and convulted thoughts, by writing, which helps you release stress and takes a greater burden off your shoulders
CONNECT WITH THERAPISTS
Connect to a therapist based on your preferences to seek help for your problems

Image 6.2.3

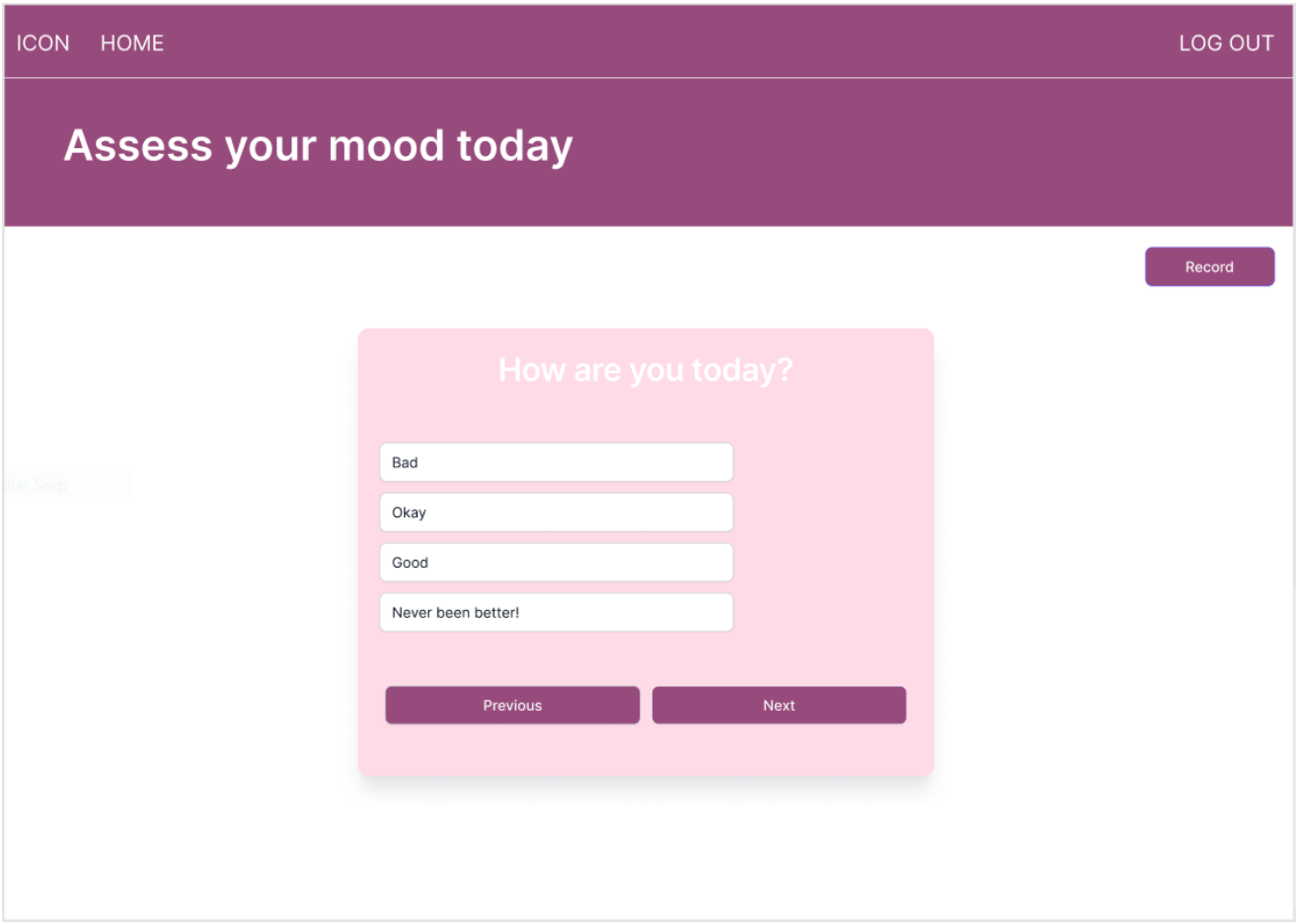

ICON
HOME
LOG OUT
Assess your mood today
Record
How are you today?
Bad
Okay
Good
Never been better!
Previous
Next

Image 6.2.4

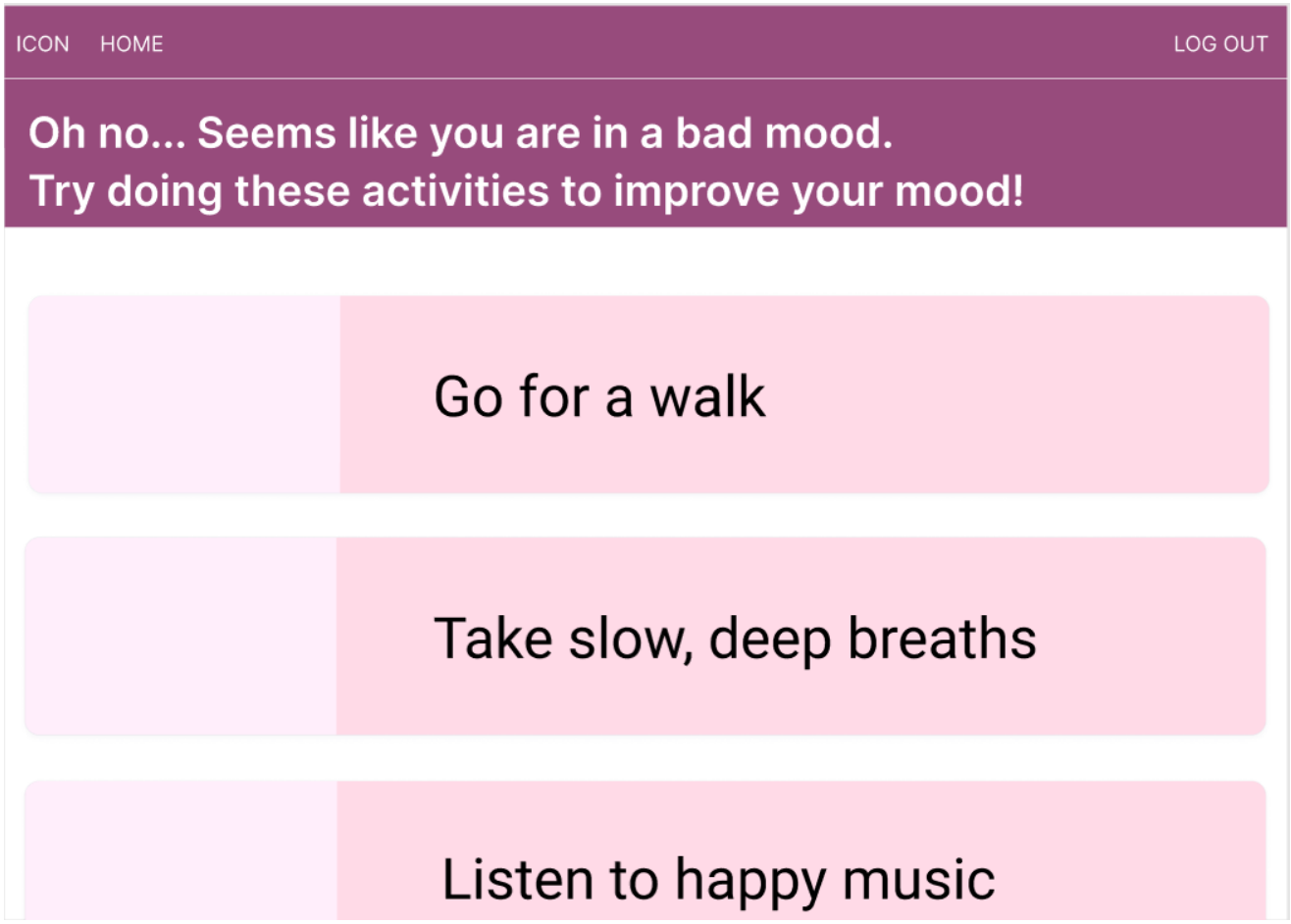

ICON
HOME
LOG OUT
Oh no... Seems like you are in a bad mood.
Try doing these activities to improve your mood!
Go for a walk
Take slow, deep breaths
Listen to happy music

Image 6.2.5

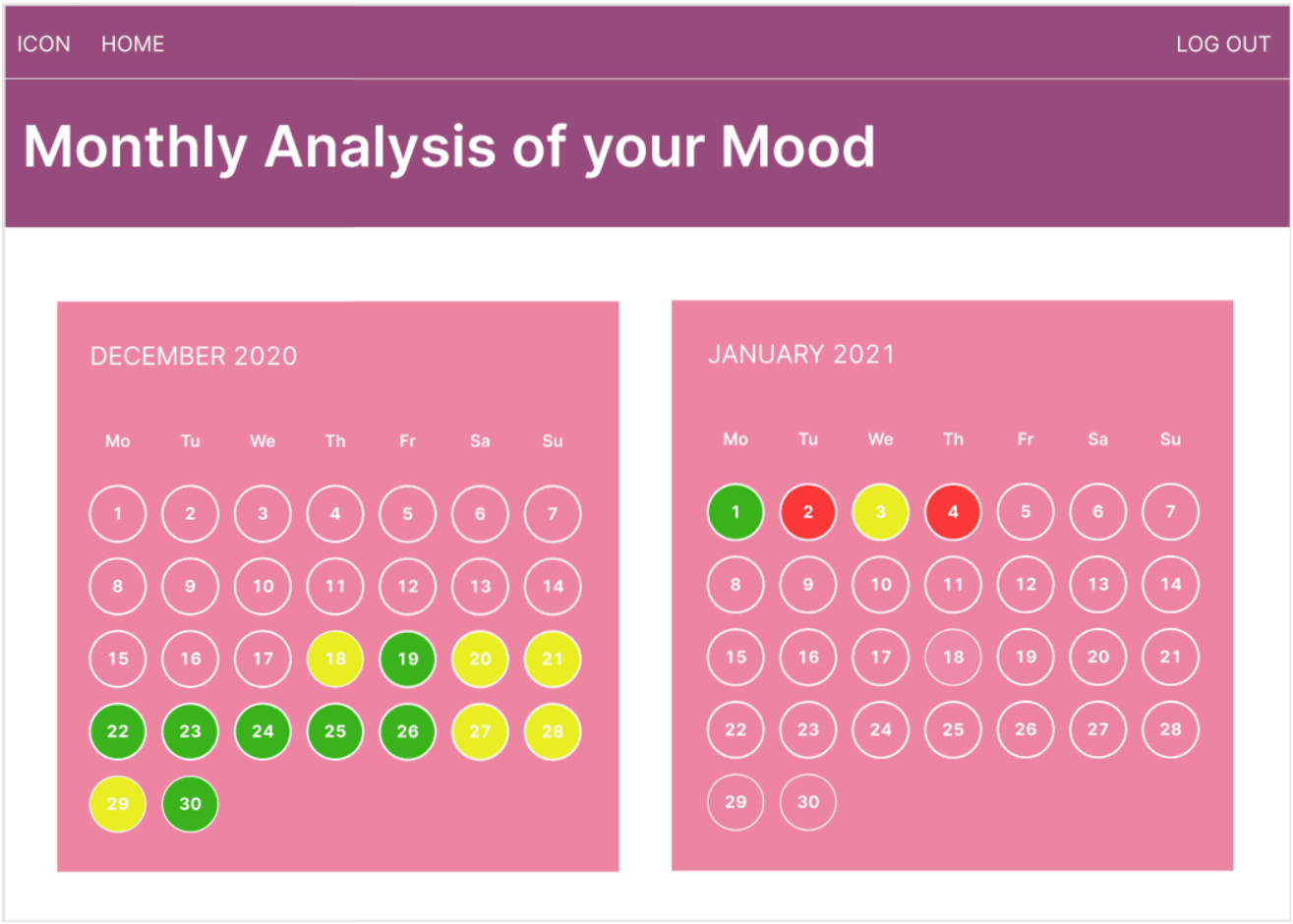

ICON HOME
LOG OUT
Monthly Analysis of your Mood
DECEMBER 2020
Mo Tu We Th Fr Sa Su
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30
JANUARY 2021
Mo Tu We Th Fr Sa Su
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30

Image 6.2.6

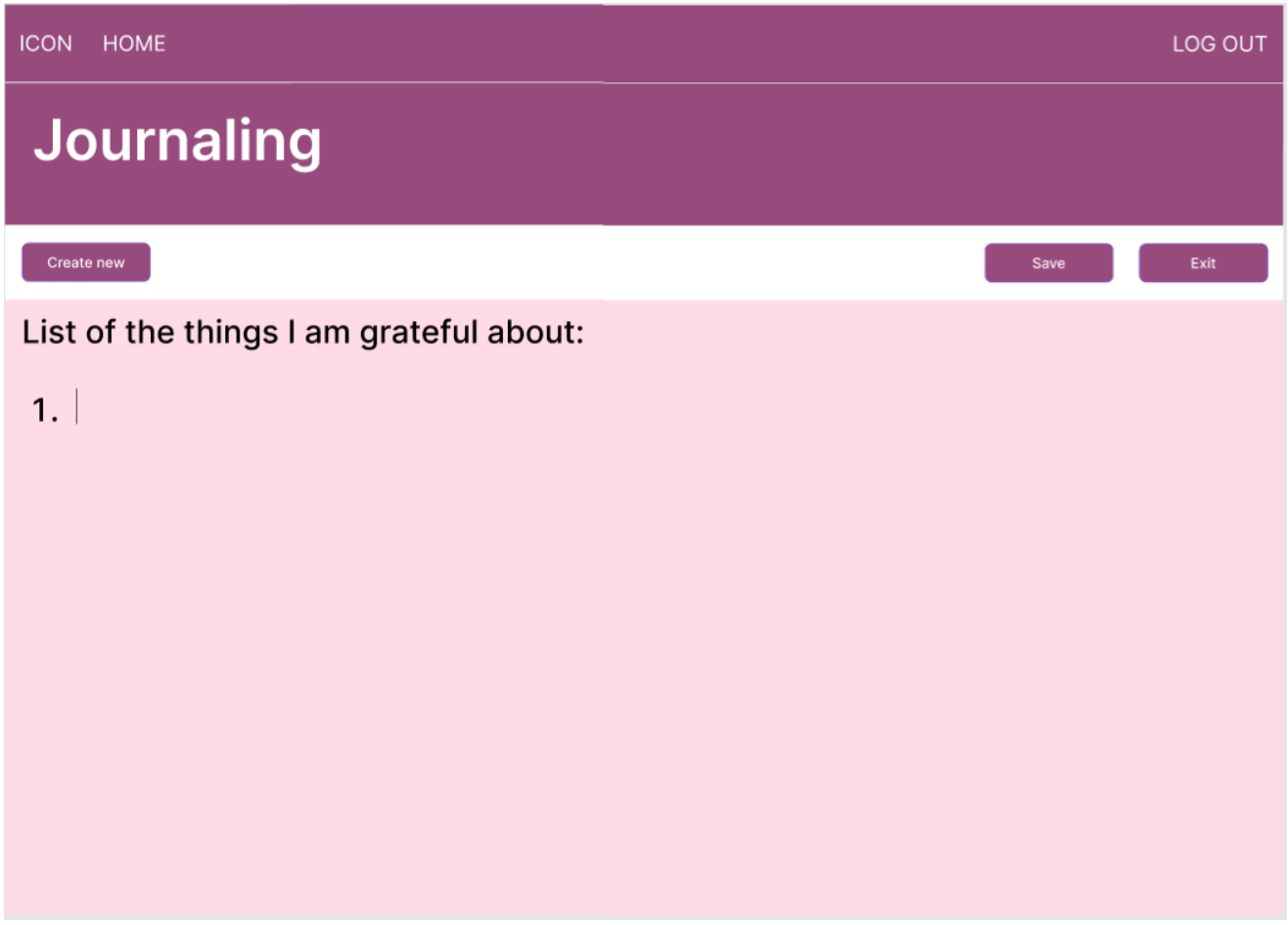

ICON
HOME
LOG OUT
Journaling
Create new
Save
Exit
List of the things I am grateful about:
1.

Image 6.2.7

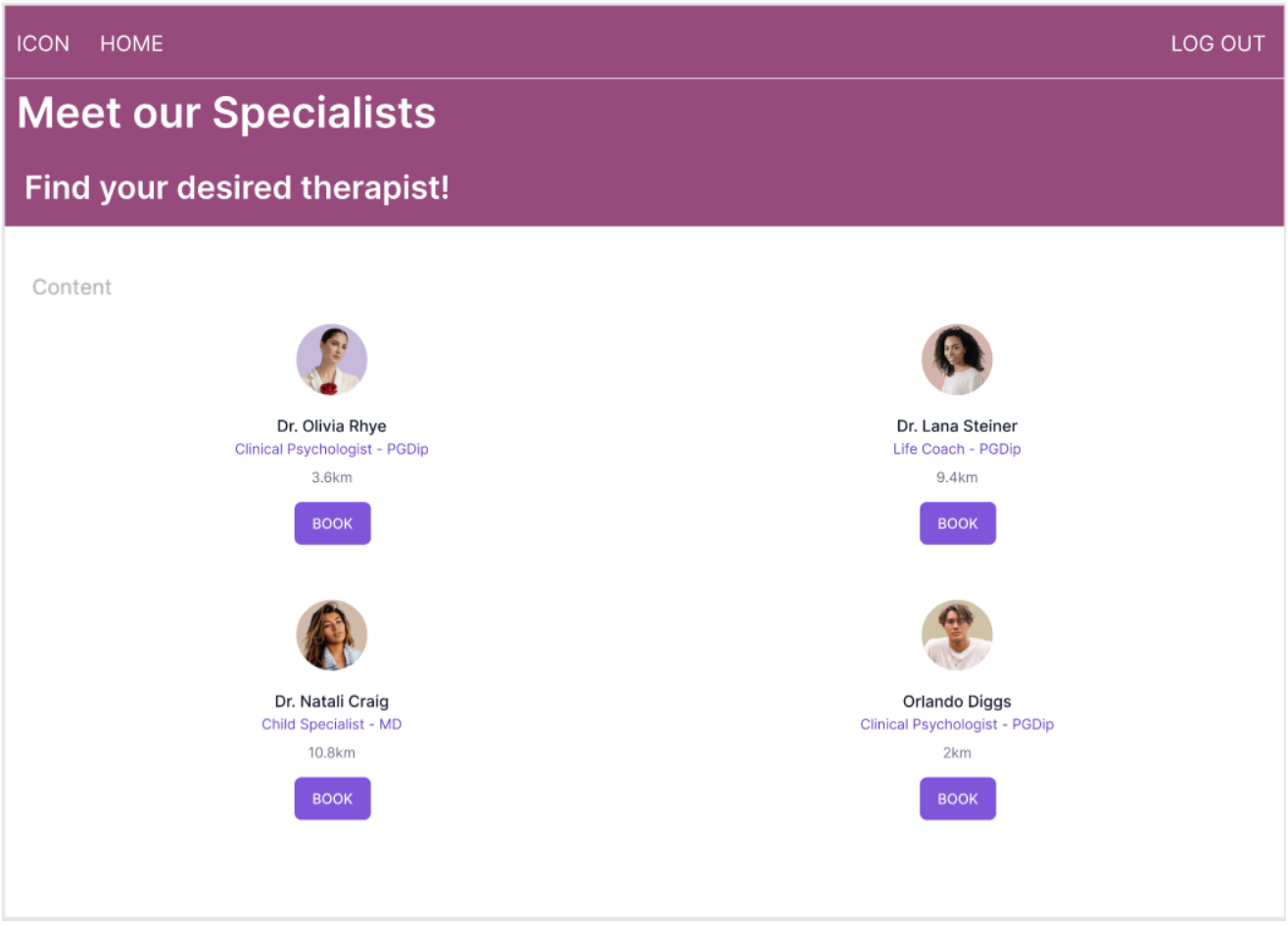

ICON HOME
LOG OUT
Meet our Specialists
Find your desired therapist!
Content
Dr. Olivia Rhye
Clinical Psychologist - PGDip
3.6km
BOOK
Dr. Lana Steiner
Life Coach - PGDip
9.4km
BOOK
Dr. Natali Craig
Child Specialist - MD
10.8km
BOOK
Orlando Diggs
Clinical Psychologist - PGDip
2km
BOOK

Image 6.2.8

6.3 Screen Objects and Actions

Image 6.2.1

Email and password text field takes user input on their login details. Sign in button takes the user to the homepage. Forgot password button takes the user to a screen where they can change their password when they have forgotten it. Sign up button takes the user to the sign up page.

Image 6.2.2

Email, name, age, dob, gender and password text field takes user input for their sign up details. Create account button takes the user to the homepage. Login button takes the user to the login page.

Image 6.2.3

Happiness tracker button takes the user to a page where a series of questions are asked to the user about their mood. Journaling button takes the user to a screen where they can start writing down their thoughts and feelings. Connect with therapists button takes the user to a screen where a user can choose therapists they would like to consult.

Image 6.2.4

The user is directed to the questions page every time when more information is required for processing. The questions are displayed on a card and are navigated by the previous and next buttons. The answers can be multiple choices, check boxes, sliders or just plain old text. The answers are processed after which they are directed to the corresponding requested pages.

Image 6.2.5

The activities to improve mood are displayed based on the result of the mood analysis.

Image 6.2.6

Monthly analysis of your mood is displayed where one can see the records of the results of the test taken in the happiness tracker.

Image 6.2.7

A space is available to the user to write down their thoughts and feelings. Create new button opens a new space where a user can start writing anew. Exit button takes the user to the homepage. Save button saves the written record.

Image 6.2.8

The page displays the list of therapists that were filtered based on the user's and therapists preferences. The screen lays out the therapists and their key details such as their name, education, specialization and their distance from the user from where the user is able to contact the therapist of their choice by clicking on the book button. The book button directs the user to the particular therapist's page or their socials.

7. REQUIREMENTS MATRIX

SYSTEM COMPONENTS	FUNCTION REQUIREMENT ID (referring from SRS doc)	FUNCTIONAL REQUIREMENT
Mood Tracker	4.1.3 REQ-1	A PC or Laptop with Internet connection
	REQ-2	Mandatory to attend all the questions asked to the user
	REQ-3	User must have an account created
	REQ-4	System should make sure that a question has been answered

		before moving on to the next one
Recommending activities to improve mood	4.2.3 REQ-1	A PC or Laptop with Internet connection
	REQ-2	System should recommend appropriate activities according to the mood estimated
Journaling	4.3.3 REQ-1	A PC or Laptop with Internet connection.
	REQ-2	System should suggest ideas that can be written in a journal
	REQ-3	System should auto-save the content written in an entry
Matching to therapist based on user preferences	4.4.3 REQ-1	A PC or Laptop with internet connection
	REQ-2	User should enter his answers to all the questions displayed
	REQ-3	System should make sure that all questions has been answered
Display profiles of therapists	4.5.3 REQ-1	A PC or Laptop with internet connection

Plagiarism Report: